Abstract

This study investigates the extraction of heavy metals from vegetables, specifically radish and spinach, irrigated with water containing industrial effluent and compares them with samples irrigated with doubly distilled water devoid of industrial contaminants. Utilizing Atomic Absorption Spectrometry as the primary analytical tool, hazardous materials were identified and effectively removed during experimental procedures. The study addresses a pressing concern of heavy metal contamination in vegetables grown in regions with access to industrial effluent and tube well water. Elevated concentrations of heavy metals, including chromium, cobalt, copper, and cadmium, in locally cultivated produce pose significant health risks. However, a beacon of hope emerges through the application of Nymphaea Alba as an adsorbent. This natural material exhibits remarkable efficiency in reducing heavy metal uptake by vegetables, independent of the initial contamination levels in irrigation water. The research identifies prolonged contact times and increased adsorbent usage as critical factors in enhancing the remediation process's effectiveness. These findings hold practical implications for ensuring food safety and environmental health in areas grappling with agricultural challenges stemming from industrial effluent. Harnessing the potential of Nymphaea Alba and further optimizing its application presents a tangible opportunity to mitigate heavy metal contamination and promote safer, healthier agricultural practices. This study underscores the importance of ongoing efforts to address the intricate relationship between industrial activities and agriculture, with the ultimate goal of safeguarding both human well-being and the environment.